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A SEARCH FOR THE PRESENCE OF PATHOGENIC BACTERIA AND FUNGI IN THE INTERDIGITAL SPACES OF THE FOOT.

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In any survey of the incidence of tinea pedis a constant finding is the wide discrepancy between the number of subjects showing clinical abnormality in the interdigital spaces, and the number in which a pathogenic fungus can be demonstrated. Ajello and his co-workers (1945) in the United States of America found that 59·9% of 871 males had clinical signs of tinea pedis but in only 18·1% was a pathogenic fungus found by direct examination or culture. Moreover, the interdigital skin in which fungus was found was not clinically suspect in 1·7% subjects. In Australia, Linn and Magarey (1941) found clinical abnormality in 71·1% of males but demonstrated the presence of fungus in only 1·7%.

In an earlier survey of 568 students of Otago University (Marples and di Mena, 1949) clinical evidence of athlete's foot* was found in 358 subjects, but laboratory confirmation of a fungus infection was obtained in only 78, of which 7 showed no clinical abnormality.

A further discrepancy occurs between those who have maceration and scaling in the fourth interdigital space, and those who have subjective symptoms of itching, burning or pain. Ajello *et al.*, record such symptoms in only 42 of the group which they examined.

The present investigation was undertaken in an attempt to determine whether the discrepancy between clinical and laboratory findings could be explained by the presence of pathogenic bacteria in the abnormal interspace,

* "Athlete's Foot" in this paper is defined as any visible abnormality of the interdigital space, whether scaling, maceration, fissures, regardless of the presence or absence of discomfort to the subject. "History of Athlete's Foot" means a history of such visible abnormality.

and whether subjective symptoms could be related to any particular bacterial or fungous associations. The subjects included in the survey consisted mainly of university students, but in order to increase the sample of individuals with subjective symptoms, about 20 patients who visited the Medical School for laboratory confirmation of a clinical diagnosis of tinea pedis were included. The investigation consisted of a simultaneous sampling of the bacterial and fungous flora, an area of normal skin being used as a control for the bacterial sample.

Material and Methods.

The name, sex and age of each subject was recorded and enquiry was made for a previous history of athlete's foot, with or without symptoms. Any form of treatment, either present or past, was also noted. Other information sought was a history of ringworm in other parts of the body, of allergic conditions of any kind, and of previous skin conditions. Each person was asked whether he or she discarded socks or stockings during summer months, or whether they were worn throughout the year. An answer to the direct question " Have you any itching, burning or discomfort in the foot now ? " was also obtained from each subject.

This was followed by a clinical examination of the right foot if no history of athlete's foot was obtained, or of either or both feet if a previous attack was reported. The incidence and site of maceration, scaling and fissures was recorded. The bacterial sampling was then undertaken. The fourth interdigital space was swabbed with a sterile throat swab moistened with nutrient broth. If the skin of the first interspace showed no abnormality a similar sample, using a second swab, was taken as a control. Additional samples were taken from subjects in whom the skin of other interspaces showed maceration or scaling. In two cases, all the interdigital spaces had abnormal skin, so the control sample was taken from an area on the dorsum of the foot. The fourth interspace was then washed with ether and scrapings were taken, using flamed pointed forceps. Two Sabouraud agar slopes were inoculated with one or more skin fragments. A third sample was taken for direct examination. In the first 50 subjects, a bottle of medium containing Actidione was used instead of one of the tubes of Sabouraud agar, but the ether washing was found to be so effective in preventing the growth of non-pathogenic fungal contaminants that the use of Actidione was discontinued.

The broth-moistened swabs used for bacterial sampling were inoculated on to blood agar plates, and incubated aerobically at 37° C. for 24 hours. The plates were then examined and the different types of colonies noted. Smears were then made from each type of colony, stained by Gram and examined microscopically. All staphylococcal colonies, regardless of their pigment production or haemolytic powers, were sub-cultured on nutrient agar slopes and subsequently tested for coagulase production, using Fisk's tube method. The haemolytic action of streptococcal colonies was noted, and strains were sub-cultured in glucose hormone marble broth, and after incubation, back on to blood agar for confirmation of the type of haemolysis.

Gram negative bacilli were sub-cultured on MacConkey agar to test for the fermentation of lactose, but non-lactose fermenters were not further identified. The haemolytic powers and size of diphtheroid colonies were noted and sub-cultures were made on nutrient agar slopes. Diphtheroids isolated from the first 50 subjects were examined for cellular morphology after growth on Loeffler slopes, and their fermentation reactions in serum agar indicator media containing various carbohydrates were studied. The results obtained, however, were so variable, and the colonies of diphtheroids in the primary cultures so regularly encountered that no attempt was made to identify the diphtheroids further. They appeared to be part of the normal

flora and of no pathological significance. The few strains of Gram-positive bacilli isolated were sub-cultured on nutrient agar slopes and, after incubation, smears were examined and the presence of spores was noted. They were not identified further.

Evans and his co-workers (1950) have drawn attention to the importance of anaerobic organisms in the normal flora of the skin. In order to discover whether incubation in anaerobic conditions would provide a different picture of the flora of the interdigital spaces, parallel cultures of samples taken from the second foot of 10 subjects examined consecutively were inoculated on to blood agar, and incubated anaerobically. The types of colonies isolated on these plates were noted and each type was sub-cultured on an appropriate medium which was incubated in aerobic conditions. Since the primary isolations on anaerobic culture presented precisely the same appearance as those incubated aerobically, and since all the aerobic sub-cultures from these plates showed good growth, anaerobic culture was not continued. The difference in this result from that reported by Evans *et al.* may be due to the different method of sampling used, or to the different structure of the skin sampled.

Cultures from pathogenic fungi on Sabouraud glucose agar were incubated at 27° C. and examined at intervals for 5 weeks, after which they were discarded. Colonies with the appearance of pathogenic moulds were examined microscopically and colony characteristics and pigment production were noted. Culture mounts or slide cultures stained with lacto-phenol cotton blue were examined for microscopic characters. Yeast-like colonies were sub-cultured on corn meal agar plates and into fermentation tubes containing 2% glucose, sucrose, maltose and lactose respectively. Strains were identified as *Candida albicans* on the basis of chlamydospore production and fermentation reactions. Strains of yeasts which did not have the characters of *C. albicans* were not identified further.

Scrapings of skin taken for direct examination were mounted in 10% KOH. The slides were kept for several hours or overnight in a moist chamber if the skin was very thick. They were then searched, under the microscope, for the presence of hyphae. " Mosaic " collections were also noted.

Results of the Survey.

The study included 175 subjects of which 41 were females. The ages ranged from 16 to 48 years, but 70·1% were between the ages of 20 and 24 years.

Table I shows the percentage incidence of a previous history of athlete's foot and of the other conditions noted, and also the findings at the clinical examination. The subjects are arranged in three clinical groups—those with normal skin in all interdigital spaces, those with one or more abnormal spaces but no subjective symptoms, and those with both abnormal interdigital spaces and symptoms at the time of examination. Since no obvious differences between the sexes were obtained, the findings in males and females have not been shown separately. Socks or stockings were worn throughout the year by 89 individuals.

As will be seen from Table I, the incidence of an allergic history is equally distributed in the three clinical groups and the same is true of a history of ringworm. At the beginning of the survey, it was postulated that the development of clinical symptoms of tinea pedis might be related to an allergic diathesis

or to previous sensitization by some other form of ringworm. The results obtained do not support this theory. The possibility that going without socks or stockings during the summer might reduce the incidence of tinea pedis with or without symptoms is also not supported, as again the subjects who wore them all the time are equally distributed within the local groups.

Clinical Findings.

The interspaces of the foot showed no abnormality in 45 subjects, although 13 of these reported a previous history of athlete's foot. In the remaining 130, scaling or maceration were found in the fourth or more interdigital spaces. In all but two however, the first space appeared to be normal, and was used for the control bacterial sample. Of the 130 with an abnormal interspace, 54 showed definite maceration, and fissures were present in 30 subjects. The rest showed only scaling of the skin. The percentage incidence of these conditions is shown in Table I.

TABLE I.—*The Previous History and Clinical findings in* 175 *Subjects Examined for the presence of Tinea pedis.*

Previous history. Clinical features etc.	All interspaces normal.	Abnormal interspace. No symptoms.	Abnormal interspace with symptoms.	Total.
Number of subjects.	45.	96.	34.	175.
	(%)	(%)	(%)	(%)
History of athlete's foot	28·9	72·9	97·0	71·4
History of subjective symptoms	22·2	44·8	50·0	40·0
History of allergy	28·9	21·9	29·4	25·1
History of tinea capitis or corporis	17·7	22·9	23·6	21·7
Socks or stockings worn throughout year	46·4	57·3	38·2	50·8
Abnormal space showing scaling only	—	55·2	14·7	33·1
Abnormal space macerated	—	34·4	61·9	30·8
Fissures present	—	20·8	50·0	21·1
Fungus demonstrated	8·9	12·5	58·8	20·6

Laboratory Findings.

Table II shows the results of laboratory investigations in the three clinical groups. For convenience, all the findings have been referred to the first or the fourth interspace, but in a few subjects where the third space showed greater abnormality it was sampled in preference to the fourth. The presence of a pathogenic fungus was demonstrated in 36 subjects. Of these, 4 showed no abnormality of the interdigital skin, 12 had asymptomatic scaling or macerated interspace and 20 had both clinical evidence and symptoms of infection.

Mycological Findings.

Table III shows the mycological findings in the 36 subjects in which the presence of a pathogenic fungus could be demonstrated. Fungal hyphae

TABLE II.—*Laboratory Findings in* 175 *Subjects Examined for the presence of Tinea pedis.*

Micro-organisms isolated.	All interspaces normal.	Abnormal interspace. No symptoms.	Abnormal interspace with symptoms.	Total.
Number of subjects.	45.	96.	34.	175.
	(%)	(%)	(%)	(%)
Pathogenic fungus demonstrated 4th space	8·9	12·5	58·8	20·6
Staphylococcus epidermidis 4th space	60·0	36·4	41·2	43·4
,, ,, 1st space	91·1	77·0	76·5	80·6
Non-haemolytic staphylococcus 4th space	91·1	81·3	82·4	84·0
,, ,, 1st space	97·8	92·7	94·1	94·3
Haemolytic staphylococcus 4th space	88·9	88·5	94·1	89·8
,, ,, 1st space	68·9	85·5	88·2	81·7
Coagulase positive staphylococcus 4th space	8·9	9·4	64·7	20·0
,, ,, ,, 1st space	2·2	4·2	23·6	7·4
,, ,, ,, both spaces	2·2	4·2	23·6	7·4
Coagulase positive staphylococcus + pathogenic fungus 4th space	2·2	3·1	47·0	11·4
Non-haemolytic diphtheroid 4th space	48·4	79·1	73·5	70·3
,, ,, 1st space	20·0	41·6	23·6	32·6
Haemolytic diphtheroid 4th space	13·3	19·7	2·9	14·8
,, ,, 1st space	8·9	6·2	0	5·7
Other bacteria 4th space	2·2	7·3	11·8	6·8
,, ,, 1st space	4·4	16·6	8·8	10·3

were seen on direct examination of 30 skin samples, and a positive culture was obtained from 26 subjects, 18 of whom had been found to be carrying a fungus on direct examination. Of the cultures obtained, 20 strains were identified as *Trichophyton mentagrophytes*, using the classification of Conant *et al.* (1945) which includes *T. interdigitale* within the species *T. mentagrophytes*. Three strains of *Epidermophyton floccosum*, one of *Candida albicans* and two of *Microsporum canis* were also isolated. No strains of *T. rubrum* were recognised at the time of this survey, but since its completion, one of us has had the opportunity of examining strains of this species isolated in several laboratories in Great Britain. On the criteria used by British workers, it seems possible that some of these Dunedin isolates would have been assigned to this species. They are therefore shown in Table III grouped together as *Trichophyton* spp. Ajello (1945) and Ingram (1955) have drawn attention to the increasing importance of *T. rubrum* in the aetiology of tinea pedis. This species has been isolated from various clinical conditions in Dunedin, and is no doubt imported into New Zealand at times, since it is a common cause of tinea corporis in the Pacific islands within New Zealand's sphere of influence. *M. canis* in the interdigital space is an unusual finding, but has been reported elsewhere. This species is the most common cause of scalp and body ringworm in New Zealand. Non-pathogenic yeast-like organisms were recovered from the fourth interdigital space in 20 subjects and from the first interspace in 3. These were presumably transient organisms which were not part of the normal flora.

di Menna (1954) has shown that the non-pathogenic yeasts on the skin closely resemble those obtained by air-sampling.

TABLE III.—*Mycological Findings in Subjects in which a Pathogenic Fungus could be Demonstrated.*

	Number.
Subjects in whom pathogenic fungus was demonstrated	36
Fungus seen on direct examination of skin scrapings	30
Strains of pathogenic fungi isolated in culture	26
Trichophyton spp.	20
Epidermophyton floccosum	3
Microsporum canis	2
Candida albicans	1

Bacteriological Findings.

The results of the bacteriological survey are shown in Table II. The flora of both first and fourth interspace were limited in quality. The staphylococci isolated are divided into the following four groups: Coagulase-positive, haemolytic, non-haemolytic and *Staphylococcus epidermidis*. The last group includes organisms which appear to be the same as those isolated by Evans *et al.* (1950) from 50% of 130 aerobic cultures of skin samples. The characteristics of this organism can be found in the Sixth Edition of the *Manual of Determinative Classification* (1948). The organism is called *Micrococcus epidermidis* in this volume, and this name is probably the correct one to use.

Of these four groups of staphylococci, only the pathogenic coagulase-positive organisms showed an irregular distribution among the three clinical groups. Pathogenic strains were recovered from the first interspace of 13 and from the fourth interspace of 35 subjects. Among those with normal interdigital skin of the fourth space, 8·8% carried a pathogenic staphylococcus, and strains were recovered from 9·3% of those with asymptomatic abnormal skin. But a strain of coagulase-positive staphylococcus was present in 64·7% of subjects with clinical symptoms of tinea pedis. All those who carried the pathogen in the first space carried it also in the fourth. This association of subjective symptoms with the presence of a coagulase-positive staphylococcus is statistically significant ($p < \cdot001$). Not all the coagulase-positive staphylococci isolated had the characteristics of *St. pyogenes* var. *aureus*. Five of the strains produced white colonies, and two were non-haemolytic.

Diphtheroid colonies were grouped as haemolytic and non-haemolytic and were not identified further. They showed considerable variation in the size and texture of the colony, and in fermentative power where this was tested. Non-haemolytic diphtheroids appeared to flourish where the interdigital skin was abnormal. Haemolytic strains were less frequently encountered and their distribution, as will be seen from Table II, suggests that their growth

might be inhibited by some factor present in the itching interdigital space. Further investigation would be necessary to determine whether there is any significance in their irregular distribution.

Bacteria other than those discussed above were isolated from the first interspace of 10·3% and the fourth of 6·8% subjects. They included aerobic spore-bearers, sarcinae and Gram-negative bacilli, all probably members of the transient skin flora. A few strains of streptococci were isolated, some of which showed β-haemolysis. Haemolytic strains were, however, so rarely encountered that it seems unlikely that they play any part in the aetiology of tinea pedis.

Associations of Pathogenic Fungi with Coagulase-positive Cocci and Other Potential Pathogens.

Coagulase-positive staphylococci in the fourth interspace in which a pathogenic fungus also could be demonstrated were found in 11·4% of all subjects. The association was not equally distributed in the three clinical groups. The two organisms were found together in 2·2% of those with normal interspaces, in 3·1% of those with an abnormal interspace but no symptoms, and in 47% of those with subjective symptoms. The correlation between the presence of subjective symptoms and this association is also statistically significant.

The fungus was found together with a β-haemolytic streptococcus in one person with abnormal skin but no symptoms, and in one with subjective symptoms.

"Mosaic" Fungus on Direct Examination of the Skin.

There has been some controversy over the significance of mosaic fungus in the diagnosis of fungous infection. Weidman (1927) suggested that it might represent disintegrating hyphae, but Davidson and Gregory (1935) demonstrated that the appearance was an artefact due to the precipitation of cholesterol crystals. Dowding (1952), however, suggested that mosaic was associated with the presence of fungus and was an extracellular deposit of a fungus living in the deeper layers of the epidermis.

During this investigation, mosaic fungus was seen on direct examination of scrapings from 48 subjects. Table IV shows the other findings in these subjects compared with those in which no mosaic was found. As will be seen from the table, there was no significant difference in the distribution of proved fungous infection in those in whom mosaic fungus was, or was not, found. There was also no correlation between the presence of mosaic and the clinical findings of scaling or maceration of the interspace. A previous history of athlete's foot was given in 67% of those with mosaic and in 73% of those without. It was thought that the presence of mosaic might be associated with the use of fungicides at the time of examination, but while 4% of individuals carrying

mosaic were using fungicides, 9% of those without mosaic were under treatment. The presence of mosaic could not be correlated with any species of the bacterial flora isolated, and it seems probable that it results from conditions in the skin of the host rather than that it is related to a fungal or other parasite. The results of the present survey do not suggest that mosaic is an indication of infection with a pathogenic fungus.

TABLE IV.—*The Clinical and Laboratory Findings in Subjects Showing "Mosaic" Collections in Skin from the 4th Interspace, Compared with those in which "Mosaic" was not seen.*

	Mosaic found on direct examination of skin.	No mosaic found on direct examination of skin.
Number of subjects.	48.	127.
	(%)	(%)
Interspace showing normal skin	22·9	26·8
,, ,, only scaling	52·1	42·5
,, ,, maceration	25·0	32·3
History of athlete's foot	66·7	73·2
History of subjective symptoms	37·5	41·0
Symptoms at the time of examination	10·4	23·6
Treatment with fungicides at the time of examination	4·2	9·5
Socks or stockings worn throughout the year	47·9	52·0
Pathogenic fungus demonstrated	16·7	22·1
St. epidermidis in 4th space	29·2	48·8
Coagulase positive staphylococcus in 4th space	6·3	25·2
Non-haemolytic diphtheroid in 4th space	70·8	70·1
Haemolytic diphtheroid in 4th space	22·9	11·8

DISCUSSION.

The results of this investigation have not revealed any aerobic bacterium which could be regarded as important in initiating asymptomatic skin changes in the interspaces of the foot. The asymptomatic abnormal interspace does seem to support a qualitatively rather different flora from the normal interspace, since diphtheroids were much more commonly found where the skin was scaling or macerated, and *St. epidermidis* was present in a larger proportion of subjects with no abnormality of the spaces. This difference, however, seems undoubtedly to be secondary to the clinical abnormality, and to be the result of ecologically different habitats. A quantitative estimation of the flora of the interspaces was not attempted during the present work, but the primary isolations showed considerable quantitative variation in the different types of colonies, with a much larger total population of the fourth than of the first, and of the abnormal than the normal space.

When there is discomfort in the interspace the situation however appears to be different. The finding of coagulase-positive staphylococci in the fourth interspace in such a high proportion of subjects with clinical symptoms suggests that these organisms play a part in the production of the itching and burning

of tinea pedis. It is well known that secondary infection of the abnormal interspaces can occur and can spread to other parts of the foot, but none of the cases included in this survey showed an extensive inflammatory reaction, and all appeared to be uncomplicated tinea pedis. Pillsbury and Kligman (1954) have pointed out that the isolation in culture of pathogenic staphylococci and streptococci from a lesion of the skin does not necessarily mean that there is a secondary infection. These authorities have stressed the value of a direct Gram-stained smear and say that in lesions which are clearly secondarily infected large numbers of bacteria and of polymorphonuclear leucocytes are found. They regard bacterial phagocytosis by leucocytes as good evidence of the operation of a defence reaction. A series of direct smears was made, during this work, from the interspaces of subjects with clinical symptoms. These smears showed only a few disintegrating cells and small numbers of bacteria. Therefore on the criteria of Pillsbury and Kligman, these lesions were not truly secondarily infected, yet the discomfort of athlete's foot in this survey appears nevertheless to be associated with the presence of pathogenic staphylococci. The results suggest that clinical symptoms of tinea pedis are the outcome of the association of pathogenic fungi and pathogenic staphylococci, even in cases which are not acutely inflamed and which are usually regarded as purely mycotic in origin. If this is so, some alteration in the treatment of athlete's foot might be worth considering. In subjects with extensive secondary infection of the foot, a preliminary course of mild treatment to reduce inflammation, before the application of fungicides, is usually advised. It is possible that a two-stage treatment in all forms of athlete's foot with subjective symptoms, the first stage directed specifically towards the staphylococcus and the second towards the fungus, might produce a more satisfactory final result.

Summary

A survey of the pathogenic bacteria and fungi in the fourth space of the foot in 175 subjects was carried out. The first interdigital space was sampled as a control.

In 45 subjects the interdigital spaces showed no clinical abnormality; 96 had asymptomatic maceration or scaling; in 34 the interspace was abnormal and subjective symptoms were present at the time of examination.

The presence of a pathogenic fungus was demonstrated in 20·6% of all subjects. Fungus was present in 8·9% of those with a normal interdigital space, in 12·5% of the group with an asymptomatic abnormal space and in 58·8% of those with symptoms.

Coagulase-positive staphylococci were isolated from 20% of the subjects, but were not evenly distributed in the three clinical groups. They were found in 8·9% of normal interspaces, in 9·4% of abnormal asymptomatic interspaces and in 64·7% of those with symptoms. The association of coagulase-positive staphylococci with the presence of symptoms is statistically significant.

The distribution of other bacteria is recorded; there was no significant variation in the flora of either the first or fourth interspace in the three clinical groups.

The recovery of both a pathogenic fungus and a pathogenic staphylococcus from the same interdigital space occurred in 11·4% of the subjects, but while this association was found in only 2·2% of normal interspaces and 3·1% of those without symptoms, it occurred in 47 0% of those with symytoms. This finding is also statistically significant.

Mosaic fungus was found on direct examination of the interdigital skin of 48 subjects. No evidence was obtained to show that it was associated with mycotic infection, and it did not appear to be related to any clinical finding or bacterial species.

The significance of the association of a coagulase-positive staphylococcus and a pathogenic fungus in the causation of the symptoms of tinea pedis is discussed.

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References.

Ajello, L., Keeney, E. L. and Broyles, E. N. (1945) *Johns Hopk. Hosp. Bull.*, **77**, 440.

Bergey's Manual of Determinative Bacteriology (1948) 6th ed. London : Baillière, Tindall & Cox, p. 243.

Conant, N. F. *et al.* (1944) *Manual of Clinical Mycology.* Philadelphia and London : W. B. Saunders Company.

Davidson, A. M. and Gregory, P. H. (1935) *J. Amer. med. Ass.*, **105**, 1262.

Dowding, E. S. (1952) *Arch. Derm. Syph., Chicago*, **66**, 470.

Evans, C. A., Smith, W. M., Johnston, E. A. and Giblett, E. R. (1950) *J. invest. Derm.*, **15**, 305.

Ingram, J. T. (1955) *Bull. Post. Grad. Comm. Med. Univ. Sydney*, **2**, 1.

Linn, L. W. and Magarey, F. R. (1941) *Med. J. Aust.*, ii, 452.

Marples, M. J. and Menna, M. E. di (1949) *Ibid.*, ii, 156.

Menna, M. E. di (1954) *J. Path. Bact.*, **68**, 89.

Pillsbury, D. M. and Kligman, A. M. (1954) *In Modern Trends in Dermatology.* 2nd series. Edited by R. M. B. MacKenna. London : Butterworth & Co. (Publishers) Ltd., pp. 187–213.

Weidman, F. D. (1927) *Arch. Derm. Syph., Chicago*, **15**, 415.

THE HISTOLOGY OF SUTTON'S NAEVUS

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Any process which makes a cellular naevus disappear is of theoretical interest, and in Sutton's naevus this sometimes happens. Here, a vitiliginous condition not only depigments the centrally placed naevus at times, but may bring about its destruction. This morphological change conflicts with the prevailing view of vitiligo as a purely biochemical lesion. The literature, well reviewed by Fisher and Leider (1949), is unhelpful on these topics. Eight Sutton's naevi were subjected to histological study, stained with haematoxylin and eosin, and examined with these problems in mind.

Case Reports.

Case 1.

A girl aged 12 had a pigmented mole on the side of the neck for many years. Many others were present elsewhere. A white halo developed around this mole a year previously and gradually blanched and flattened it. No vitiligo was present elsewhere.

Examination showed an oval vitiliginous patch with a slightly raised central soft white papule.

Microscopically the central papule consisted of a proliferation, in the papillary layer, of sponge-like connective tissue, seated on the denser normal collagen masses below. The abnormal connective tissue fibres were thin, with a complex arching, twisting and whorled arrangement. The capillaries were wide. Fibroblasts were present. There were no naevus cells or infiltrate and no pigment. Just below the dermo-epidermal junction there was a somewhat dense and conglomerated connective tissue band in places.

Case 2.

A woman aged 40 had a mole on the neck which developed a white ring around it 6 months before, after which the mole became pink and ultimately white. No other white spots were present on the skin.

Microscopically the lesion occupied the upper corium (Fig. 1). The overlying epidermis was thin with a somewhat jumbled cell arrangement and had an abnormally thick gelatinous basement membrane. The collagen throughout the lesion was abnormal. It consisted of a fibrous weave of long thin branching fibre bundles with amorphous grey-staining material between. The bundles broadened in places to irregularly-shaped collagen clumps. The picture was of a flocculent fibrillar pattern, with patches of confluent granular masses as well. These changes are usually ascribed to an alteration in ground substance. Blood vessels were open, and surrounded by oedema and lymphocytes. Near the surface several spaces were

present which intersected the connective tissue. Oedema and loose lymphocytes were present here. No identifiable naevus cells were seen, but the spaces were cord-like. In the lower half of the lesion ribbon-like syncytial cells were seen showing an intimate association with the connective tissue fibres, and a complex cytoplasmic fibrillar pattern. No pigmented granules were seen in them. Because of the morphological resemblance of these cells to dermal melanoblasts, the lesion was regarded as an amelanotic blue naevus, otherwise unchanged, with possibly a destroyed cellular naevus above it.

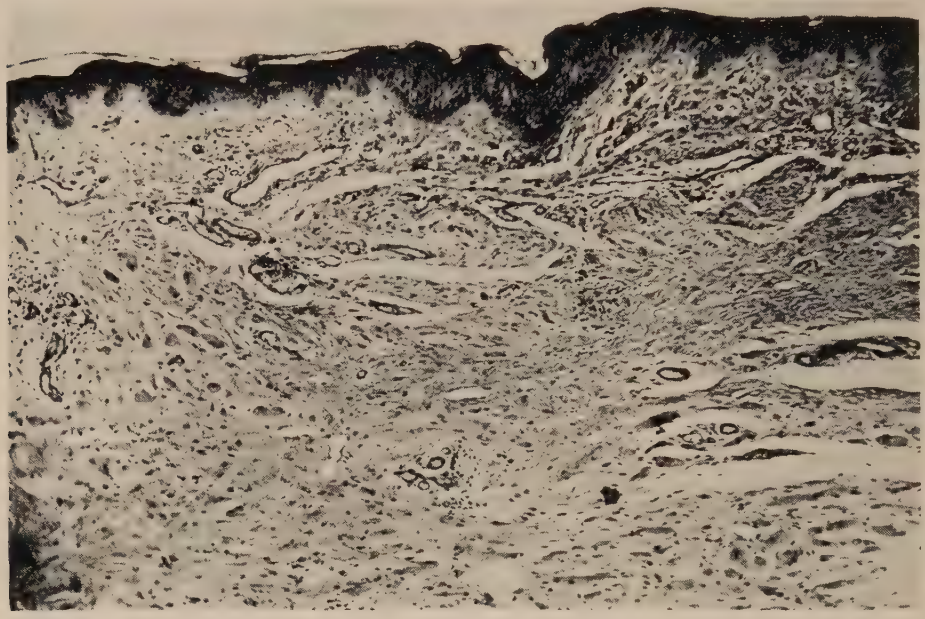

FIG. 1.—Case 2. Left lower quadrant shows the structure of an intact but pigment-free blue naevus, while the right and upper portions show trans-section of the corium by spaces possibly occupied earlier by a vanished intradermal naevus.

Case 3.

A girl aged 17 had noticed depigmentation around a raised pigmented naevus of the neck for 6 months. Three months ago it had seemed inflamed. No more accurate history could be obtained. There was no vitiligo elsewhere. The naevus was still dark and raised.

Microscopically a few spaces containing groups of shrunken cells with melanin granules could be identified between thin epidermal downgrowths in the papillary layer. In the lower papillary layer there were densely packed horizontal sheets of fibroblasts with some fibre formation. Between the fibroblasts there were lymphocytic foci around the sparse vessels. The lower edge of this band was sharp, and bordered on normal hair follicles and sebaceous glands, as well as the loose collagen of the neck corium. Only in the upper papillary region were naevus cells recognizable. They tended to lose their identity by developing watery or shrunken shredded cytoplasm with nuclear pyknosis. The nest structure was disrupted by great fibroblast and lymphocyte increases invading from below, and associated with a somewhat flocculent collagen mass in the papillary layer.

Case 4.

A 12-year-old girl had a pigmented mole on the face for many years which developed a white ring around it a year previously, after the mole had been scratched.

Microscopically the naevus showed a slightly folded surface and was traversed by numerous lanugo hairs. The naevus mass was occupied by a compact infiltrate which was well defined below, lying largely above the level of the sebaceous glands. The infiltrate, which destroyed the architecture of the naevus, was most intense at the base of the lesion, but showed a few columnar extensions to the lower cutis. It consisted almost entirely of lymphocytes and histiocytes, insofar as the cells were identified. There was no evidence of oedema or new formation of fibres. The blood vessels were stretched and compressed, and one or two intravascular polymorphs were seen. At the surface a few subepidermal melanin-containing cells were present. Naevus cells were discernible here and there by their arrangement in groups, rosettes and cords, with small amounts of dense cytoplasm and polynucleated appearance, the nuclei being crowded and the cell borders not identifiable. Naevus cell nests near the surface showed shrivelling and disarrangement of the cells with a destructive infiltration of the nests. While most naevus cells showed crowding, others were dissected apart and came to resemble lymphocytes, histiocytes or plasma cells. There were no mitotic figures.

Case 5.

A girl of 11 had a pigmented mole on the left temple since early childhood. For six weeks a pale ring had been present around it and the mole had become paler.

Microscopically a well defined naevus-cell mass was seen, sparing the junction area and not extending below the sebaceous gland level. The naevus was traversed by a large number of hairs. The detailed appearance in the naevus was practically identical with that of Case 4 except that there were nests of large cells with webby granular cytoplasm and small nuclei, which were surrounded by closely packed lymphocytes. These cell nests appeared to be centres of large reticulum cells undergoing liquefaction. They were not apparently naevus cells.

Case 6.

A girl aged 16 had a hairy mole in front of the right ear since early childhood which had developed a white area around it for 3 or 4 months. Elsewhere on the face there were several hairy and non-hairy moles.

Microscopically the naevus had similar features to Cases 4 and 5 except that the hypercellular dense lymphocytic infiltration was confined to the surface half of the naevus while the lower half was invaded in places by tracts of young fibrous tissue. The cellular infiltration did not show a sharp lower border. The epidermis showed basal layer pigmentation, and the papillary region was oedematous, with a few pigment-containing cells but no junction naevus. Several half-empty spaces of naevus-cell nests were seen in the upper corium, with a shrinkage and crowding of poorly identifiable naevus cells to one side in them. Some naevus-cell nuclei seemed to disappear by lysis while others became shrunken, pyknotic and crumbled.

Case 7.

A man aged 22 had had a mole, 2 × 1 in. " since birth " on the front of the thigh. Depigmentation set in around the mole, though he could not say when. The periphery of the mole itself had become largely depigmented, leaving a white mamillated appearance. The remaining central pigmented spot was excised.

Microscopically a hairy and warty naevus was found with naevus cells of typical arrangement. There was no follicular disturbance. The structure was disorganized

by oedema and lymphocyte infiltration. A very few polymorphs were noted in the apex of one papilla. Collections of pale large monocytic or adventitial cells were notable in the infiltrate, some with and others without pigment between them.

Case 8.

A 10-year-old boy had many pigmented naevi, and developed depigmentation around one of them on the scapular region 3 months ago. The affected naevus was becoming flatter.

Microscopically (Fig. 2) the naevus was represented by a horizontal band of cells in which very few identifiable naevus cells were seen. All the cells were closely

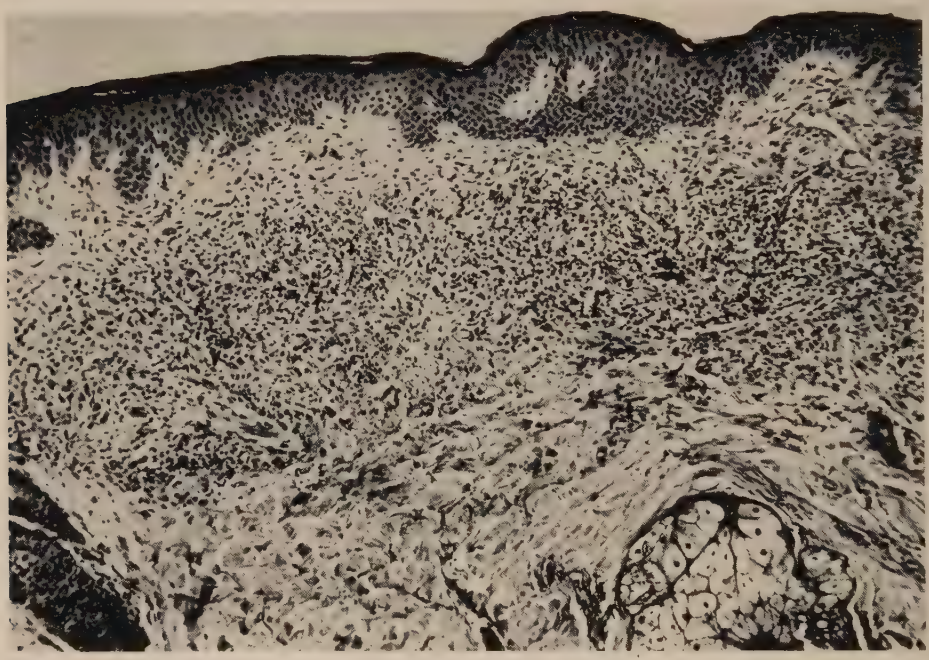

FIG. 2.—Case 8. An intradermal band of cells hardly distinguishable from a chronic inflammatory infiltrate, but considered to represent a mass of degenerating naevus cells.

packed and showed all degrees of cytoplasmic vacuolation. It was assumed, owing to the absence of other infiltrate, that almost all the cells were naevus cells, in process of vacuolar swelling, with some shrinking and pyknosis of the nuclei. A little fibroblastic and monocytic invasion was present at the lower border of the naevus. The surface papillary vessels were wide, and surrounded by many chromatophores and what probably were mast cells.

DISCUSSION.

The following generalizations apply only to the series of eight cases studied here. In all cases, there was no other vitiligo apart from the depigmentation around the naevus. Six of the patients were in their teens, one was 22 and another 40 ; six were females. Where pigment was still present in the tissue,

it was largely of chromatophore-type melanin in the papillary layer of the corium. Only two of the specimens showed a well-preserved and typical naevus structure (Cases 2 and 7), and in one of these the lesion was regarded as a blue naevus. In the remainder, varying degrees of disarrangement had taken place.

One may easily err by arranging the specimens in a series and so deduce the apparent mode of involution of the naevi. However, it is true to say that at a very early stage, the naevus cells in the cellular mass became difficult to identify. Their identification as naevi of the intradermal type rested on inference. The histological presence of numerous hairs transecting the mass and the appearance of relics of nests and cords of cells were the strongest arguments. Dr. F. P. Scott tells me he has seen a Sutton's naevus disappear, leaving only a tuft of naevus hairs on the flat depigmented skin surface.

The naevus cells lost their identity mainly by coarse cytoplasmic vacuolation leading either to enlargement of the cell, or to collapse and crowding of the cellular material in watery spaces. Cellular disintegration took place by lysis or rhexis. The naevus zone itself became invaded by cells of the lymphocyte-monocyte series, which were often hard to distinguish from altered naevus cells. Some monocytes appeared to arise by proliferation from adventitial "germ centres". All lesions in which cells were present were remarkable for their dense cellular packing, with closed capillaries, and no great intercellular oedema or new fibre formation ; the process was sharply limited to a band of cells lying between the subpapillary layer and the upper corium above the sebaceous glands. No invasive features or deeper naevus extensions were noted. Fibroblastic replacement of the mass took place from below. After disappearance of the cellular infiltrate, the collapsed pigment-free framework of the naevus consisted of a loose collagen network, with some presumed increase of ground substance, and dilated capillaries.

The occasional case of vitiligo has been reported in which lymphoreticular proliferations have been present at the edge of the active zone (Civatte, 1936 ; Gans and Steigleder, 1955). These would appear to stand closest to the changes in Sutton's naevus, where the naevus tissue is also, physiologically speaking, at the periphery of the vitiligo, despite being in the centre of the lesion. Vitiligo as seen here is therefore a more complex condition than vitiligo as ordinarily understood in having both a biochemical and an anatomical substratum that affects many tissue components in the dermis.

Summary.

Eight cases of Sutton's naevus were examined histologically. Disappearance of the naevus was found to depend on dispersion of dermal chromatophore pigment, swelling followed by necrobiosis of naevus cells, and lymphoreticular

proliferation in the site of the naevus. This was followed presumably by resorption of cellular elements, leaving a collapsed fibrous framework.

The author wishes to thank Dr. F. P. Scott of Bloemfontein for the histories and tissue of Cases 4 and 5, and Dr. L. J. A. Loewenthal of Johannesburg for the histories and sections of Cases 6 and 7.

References.

Civatte, A. (1936) *In Nouvelle Pratique Dermatologique.* Ed. Darier, J. *et al.* Paris : Masson et Cie, **1**, 302.

Gans, O. and Steigleder, G. K. (1955) *Histologie der Hautkrankheiten.* 2e Auflage, Band 1. Berlin : Springer, p. 127

Leider, M. and Fisher, A. A. (1949) *Arch. Derm. Syph., Chicago,* **60**, 1160.

HYDROCORTISONE IN NECROBIOSIS LIPOIDICA DIABETICORUM.

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Conflicting results have been obtained by various authors in the use of cortisone and hydrocortisone ointments in necrobiosis lipoidica diabeticorum. For instance, Price (1953) found little change after using cortisone ointment for one month, while Feldman (1953) in commenting on this case mentioned that two out of five cases he had been treating cleared completely and that ulceration healed during treatment. Walters (1955) used 1% and 2·5% hydrocortisone ointment in a case of the non-diabetic variety and noted that the lesion became paler and smoother with reduction in telangiectasia. In contrast, Pascher and Clyman (1954) reported no change after using 2·5% hydrocortisone ointment for three weeks; they found also that cortisone acetate by mouth given in adequate dosage for a period of two months was without benefit. Savitt (1955) noted initial improvement with cortisone ointment in a concentration of 500 mg. in 20 g. of polyethylene glycol but a subsequent relapse failed to respond to this treatment. However, six injections of hydrocortisone acetate (25 mg. per ml.) into the lesion at fortnightly intervals in doses of 0·25 ml. resulted in a 90% improvement which was maintained during the month of observation. In this country Hare (1957) presented at a meeting of the Dermatological Section of the Royal Society of Medicine a case of necrobiosis lipoidica which had improved after injections of hydrocortisone.

Since Savitt (1955) first reported a favourable response to locally injected hydrocortisone we have treated at King's College Hospital four patients with necrobiosis lipoidica diabeticorum; there were two males and two females aged between 17 and 66 years. They had suffered from diabetes for six to eighteen years and their necrobiosis had been present for two to five years. All four patients were receiving insulin, three of them being well controlled but the fourth was only moderately well controlled. There was no evidence of peripheral vascular disease and no other diabetic complications were present. The necrobiotic lesions were situated mainly on the lower legs but one patient showed lesions also on the thighs and hand. None of these had ever disappeared

spontaneously before starting hydrocortisone injections. In only one patient had ulceration occurred before treatment.

Method.

The size, shape, colour, elevation and degree of induration of the lesions to be treated were noted throughout. During the injection period the patients were seen at weekly intervals and thereafter every two or three weeks up to a maximum of forty-four weeks. Injections of 25 and 50 mg. per ml. of hydrocortisone acetate in normal saline containing 0·3% sodium carboxymethyl cellulose were compared with control injections of the base alone. For this purpose care was taken to choose lesions of approximately the same size and appearance. Closely adjacent lesions were not treated with solutions of differing strength because the results might have been difficult to interpret. The volume of hydrocortisone injected depended on the size of the lesions and varied from 0·05 ml. to 2 ml.; the amount required often decreased as improvement took place. Each injection was made through normal skin the needle then being directed into the lesion. A tuberculin syringe with a number 20 gauge needle was used for the small lesions, a number 16 gauge being used for the larger ones. Injections were given at weekly intervals, the number varying between one and twelve ; the majority received between 4 and 6. Biopsy specimens were taken before, during and after the completion of treatment.

Results.

Clinical.—Our results were classified as follows :

Group I consisted of lesions which either had disappeared completely or showed only residual discoloration.

Group II were those showing marked improvement but in which slight elevation or induration persisted.

Group III showed slight improvement but induration and elevation were still present.

Group IV represented lesions showing no improvement.

Twenty-three lesions were treated and assessed according to the above criteria. Fourteen of these were treated with the solution containing 25 mg. per ml., four with that containing 50 mg. per ml. and the remaining five received the control solution. More lesions were treated with the weaker solution than with the stronger as they were found to respond equally well, and treatment with the inert base was discontinued as it produced little if any change.

Of the fourteen cases treated with the weaker solution seven were classed as Group I, six as Group II and one as Group III. Those receiving 50 mg. per ml. showed two in Group I and two in Group II. Of the five lesions treated

with the base alone three were unchanged and two showed doubtful improvement and were therefore placed in Group III. It should perhaps be added that biopsy may have contributed to the change in one of these lesions.

Histological.—Sections of biopsies taken from untreated lesions all showed the typical histological picture of necrobiosis lipoidica diabeticorum. A similar appearance was seen in biopsies from lesions treated only with the control solution.

Sections taken at various intervals during and after treatment showed all gradations between the fully active lesions and complete healing by fibrosis. Partly healed lesions showed a decrease in the number of chronic inflammatory cells and disappearance of the degenerate areas of collagen. In many of the specimens the vessels showed obliterative endarteritis or medial hypertrophy.

The histological findings closely paralleled the clinical changes whether the improvement had been produced by single or multiple injections, and Group I lesions showed healing by fibrosis.

Complications.

Ulceration, in which hydrocortisone injections were considered to have been a precipitating factor, occurred on three occasions. Two of these ulcers followed injections of the solution containing 50 mg. per ml. and occurred within twenty-four hours of the first injection in one case and after six injections in the second case. The other ulcer followed a few hours after the first injection of 25 mg. into a lesion measuring 2·5 cm. in diameter. In this case the ulcer healed after twelve weeks in spite of continuing the injections. During this time ulceration occurred spontaneously in a large untreated lesion. The largest ulcer occurred during injections of 50 mg. per ml. in 2 ml. doses and healed only after sixteen weeks. All the lesions which developed ulceration measured 2·5 cm. in diameter or more. It was interesting to observe that when these ulcers healed they did so with apparently normal scar tissue. A further complication in two cases was the development of cellulitis which required the use of oral and local antibiotics.

Many of the lesions subjected to biopsy gaped wide open when the sutures were removed after one week. This was especially true of those being treated with hydrocortisone; better results have been obtained by leaving the sutures in place for two weeks, and the use of an antibiotic ointment at the time of biopsy was also thought to have been of help.

Apart from the two episodes of cellulitis the patients' insulin requirements did not change throughout the injection period.

Lastly, one patient noticed a peculiar erythema around the treated lesions after exposure to sunlight.

Discussion.

There is no doubt that treatment with hydrocortisone acetate injected locally into the lesions has been successful in this series of four cases of necrobiosis lipoidica diabeticorum. Nine out of the eighteen lesions treated with hydrocortisone were classified as Group I, eight as Group II and only one as Group III. Some of the lesions, especially the smaller ones, have disappeared completely except for slight discoloration. Larger lesions usually were slower to respond and required more injections of greater volume. Slight improvement occurred in two lesions treated with the control solution but as previously mentioned, other causes may have been responsible.

Injections containing 50 mg. per ml. appeared to be no more effective than those containing 25 mg. per ml. and were perhaps more likely to be followed by complications.

The injections, especially in the case of larger lesions, were often at first difficult and painful but with continued treatment the lesions became softer, the solution spread easily and painlessly and often smaller amounts of hydrocortisone were required. The number of injections needed to bring about maximum improvement was variable and difficult to determine. Those lesions showing the best results required between four and twelve injections, the majority receiving four or five injections. Prolonged observation after ending treatment is important as many lesions showed continued improvement. For instance, those showing only moderate improvement after four or five injections were found to be very satisfactory after being observed for a further few months. It may be that with an adequate follow-up period certain lesions may be found to require as little as one injection to bring about their resolution. We would suggest a follow-up period of ten months as we have seen cases continuing to improve up to that time.

It was interesting to note that lesions which responded well to treatment often developed a vivid yellow colour and a slightly depressed pale blue halo around them. The cause of the halo is not known, but it could usually be regarded as a good prognostic sign. A further point of interest was the complete disappearance of pain from the lesions during treatment in one patient.

In a few cases showing an otherwise excellent result the area of residual discoloration was larger than the original lesion.

Finally, the response to treatment appeared to be independent of the age of the patient, the duration, severity and control of the diabetes and the age of the lesions. The site of the lesion did not appear to influence the response to treatment except that those directly overlying bone were often very difficult to inject and prone to ulceration.

There has always been a close correlation between the clinical state of the

lesions and the histological findings, so much so that the pathologist (Dr. M. E. A. Powell) without any previous knowledge of the clinical picture could often suggest with considerable accuracy the stage of treatment that had been reached.

Summary.

The results of treating four cases of necrobiosis lipoidica diabeticorum with local injections of hydrocortisone are reported. Of the eighteen lesions treated, seventeen showed marked improvement or complete resolution and one was slightly improved. Three of the controls were unchanged and the other two showed slight improvement. The solution of hydrocortisone containing 50 mg. per ml. did not offer any advantage over that containing 25 mg. per ml. Certain complications of treatment are mentioned and the importance of observing the progress of the lesions over an adequate period is indicated. There was a close correlation between the clinical picture and the histological findings.

Addendum.

Since submitting this paper, five of one patient's lesions which had been treated with hydrocortisone have relapsed; this has occurred between twenty-four and forty-six weeks after stopping treatment. It has therefore been necessary to change the grading of three lesions from Group I to Group II and two from Group II to Group III. The incidence of relapse bore no apparent relationship to the strength of hydrocortisone used or the number of injections given. This further emphasises the importance of prolonged observation after finishing treatment.

We wish to thank the physicians of the Skin and Diabetic Departments for allowing us to investigate their cases; and Professor H. A. Magnus and his staff for the interpretation of the histology. We are indebted to Roussel Laboratories Limited for supplying the hydrocortisone and control solutions.

References.

Feldman, F. F. (1953) *Arch. Derm. Syph., Chicago*, **67**, 638.
Hare, P. J. (1957) *Brit. J. Derm.*, **69**, 105.
Pascher, F. and Clyman, S. C. (1954) *Arch. Derm. Syph., Chicago*, **70**, 823.
Price, H. (1953) *Ibid.*, **67**, 638.
Savitt, L. E. (1955) *Ibid.*, **71**, 506.
Walters, J. W. (1955) *Ibid.*, **72**, 94.

AN ANALYSIS OF 30,000 CASES OF SKIN DISEASE IN NORTHERN IRELAND.

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After the partition of Ireland in 1920, part of the Province of Ulster comprising the counties of Antrim, Armagh, Down, Fermanagh, Londonderry and Tyrone was designated Northern Ireland, and became a part of the United Kingdom. At the last census (1951), the population of Northern Ireland was 1,370,709, almost one third of which is in Belfast (443,671 = 32·37%).

With the introduction of the Health Services Act, 1948, many country district hospitals had their special services extended. In the period under consideration four consultant dermatologists with the help of one registrar and one senior house officer, all centred in Belfast, were between them responsible for providing a dermatological service in four Belfast hospitals and seven district hospitals. In each hospital a diagnostic index is maintained in addition to the usual alphabetical and numerical indices. At the end of each year, the figures are returned to the main teaching hospital, the Royal Victoria Hospital, Belfast ; it is an analysis of these figures for the years 1954, 1955, and 1956 which is the basis of this paper. We are indebted to Drs. McCaw, Beare, and Jefferson, for permission to combine their figures with our own.

We believe that as Northern Ireland is a circumscribed area, with little movement of population, examination of the figures to which we have access may be of interest to dermatologists in showing the relative incidence of various skin diseases in hospital practice in such an area. It is realized, of course, that these figures do not represent the incidence of skin disease in the population in general, as many common skin diseases are properly diagnosed and treated by general practitioners and so do not require consultant advice in hospital. However, it is also clear that many practitioners readily avail themselves of the service of a dermatologist where one is present in their district so that the flow of skin cases to the hospitals is substantial.

On first examining the figures, we observed that Samuel Gee's aphorism was borne out, and that " the commonest diseases are those which occur most commonly ". We found, in fact, that 26,185 (88·6%) of the cases could be grouped under 13 headings. The remaining 11·4% accounted for unusual

conditions. There were 3368 of these in the 3-year period, but insufficient for any single condition to merit special grouping.

Allowance must be made for the fact that with four dermatologists concerned variation in diagnosis is bound to occur at times. For example, what one might regard as basically a seborrhoeic condition, another might take to be essentially eczematous. However, we do not consider that this materially affects the overall totals, and as we all work together in the main teaching hospital, where there is some interchange of cases and discussion, our diagnostic approach is similar.

It should also be noted that the grouping which we have followed is mainly one of convenience for statistical purposes, and that sometimes a case could be made out for including some of the conditions under another heading. This applies particularly to the group which we have labelled "Toxic or Allergic". Our figures are analysed in Tables I and II.

TABLE I.

	1954.	1955.	1956.	Total.	%.
1. Congenital	273	308	314	895	3·06
2. Traumatic (mainly contact dermatitis)	663	657	511	1,801	6·09
3. Infective					
(*a*) Acute and chronic coccal	1,317	921	798	3,036	10·28
(*b*) Parasitic	139	141	151	431	1·46
(*c*) Fungal	345	371	298	1,014	3·47
(*d*) Viral	104	123	132	359	1·18
4. Neoplastic					
(*a*) Simple (warts)	1,500	1,738	1,967	5,205	17·85
(*b*) Malignant	247	282	310	839	2·84
5. Eczema	893	819	915	2,627	8·89
6. Toxic or allergic	511	483	506	1,500	5·08
7. Neurogenic	499	562	506	1,567	5·31
8. Seborrhoeic	1,096	1,030	1,094	3,220	10·90
9. Psoriasis	443	543	578	1,564	5·29
10. Varicose ulcer and dermatitis	171	274	233	678	2·30
11. Alopecia areata	263	257	221	741	2·51
12. Pityriasis rosea	154	172	175	501	1·72
13. Lichen planus	69	64	74	207	0·72
Total	8,657	8,745	8,783	26,185	88·6
Total cases seen	9,677	9,762	10,114	29,553	100

In the three-year period, there were in addition 37,928 return cases, making an overall total of 67,481.

TABLE II.

	1954.	1955.	1956.	Total.	%.
Impetigo	638	373	269	1280	4·33
Scabies	72	93	99	264	·89
Tinea capitis	85	82	75	242	·82
Plantar warts	419	530	612	1561	5·28
Infantile eczema	50	65	72	187	·63
Urticaria	144	135	141	420	1·42
Erythema multiforme	43	41	57	141	·48
Lupus erythematosus	39	52	53	144	·49
Acne vulgaris	472	490	519	1481	5·01

Comment.

Dermatitis and Eczema.

There will be general agreement with Bloch's statement that "the more pains one takes in the effort to find the cause in cases of eczema, the more exogenous factors will be found as the real basis for the disease". Some cases presenting the eczematous reaction are patently of external origin and where this is so they are classified as contact dermatitis. Failure to satisfy ourselves that the main cause is exogenous leads us to include them under the general heading of eczema. As might be expected, these two groups together give rise to a substantial percentage of the total (14·98%).

Superficial Infections.

Bacterial.—The introduction of satisfactory local antibiotic therapy has been followed by a steady diminution in the number of cases of coccal infection attending for hospital treatment, from 1317 in 1954 to 798 in 1956. The number of cases of impetigo fell from 638 in 1954 to 269 in 1956.

Parasitic.—The incidence of scabies is still low. There has been a suggestion recently that scabies is becoming more common, but although our figures show a slight increase, i.e. 72 in 1954 to 99 in 1956, this cannot be regarded as significant.

Fungal.—In this area, fungus infections are relatively uncommon. Perhaps the largest number of cases are those in the country districts due to cattle ringworm. The number of cases of tinea pedis is very small, and microsporum infections of the scalp form only 0·28% of the total. There was no outbreak of epidemic proportions in this 3-year period.

Viral.—We have included only herpes simplex and zoster in this group in order to separate and emphasize the large number of cases of warts seen.

Warts.—Common and plantar warts together formed 17·85% of the total cases seen and there was a noticeable progressive increase in the 3-year period. Of the 1561 cases of plantar warts seen in all hospitals in the review period, 75 (4·80%) occurred in the country districts, where swimming facilities are not available. The vast majority (95·2%) came from the Belfast and Newtownards areas, where swimming baths are widely patronized by school children.

Table III shows the percentage of warts (of all skin cases seen) occurring in the two Belfast children's hospitals, and in the Newtownards District Hospital. The figures for plantar warts are in brackets.

Table III.

	1954.	1955.	1956.
Royal Belfast Hospital for Sick Children	20·57 (5·49)	27·15 (7·12)	29·62 (8·40)
Ulster Hospital for Children and Women	34·20 (9·00)	38·24 (11·86)	50·58 (19·32)
Newtownards District Hospital	14·78 (4·58)	18·34 (4·80)	22·96 (14·00)

Toxic or Allergic.

This heading has been used mainly for statistical convenience. It includes urticaria, erythema multiforme, erythema nodosum, erythema induratum, lupus erythematosus, purpura and drug eruptions. An analysis of these various conditions showed little change from year to year.

Neurogenic.

Under this heading, we include localized and generalized pruritus for which after thorough investigation, a definite organic basis could not be found. Lichen simplex chronicus (localized neurodermatitis) and rosacea are also included.

Seborrhoeic.

While this group as a whole represents 10·9% of the total, acne vulgaris, which is included in it, accounts for 5·01%. As has been mentioned previously, the diagnostic label of seborrhoeic dermatitis is variously applied ; some reserve it for those cases where the eruption is confined to the so-called seborrhoeic areas, while others believe that a more widespread eruption can be of this nature. This is particularly so in the case of infantile eczema. The figures given, therefore, are subject to this qualification.

Pityriasis Rosea.

On further analysing the figures for this condition, it was found that the proportion of cases in the Belfast area was almost double that in the district hospitals. No such difference was found in, for example, alopecia areata, lichen planus, or psoriasis. Can this be taken to support the theory that pityriasis rosea is a virus disease? The antibody level of the virus of poliomyelitis in Northern Ireland shows the same distribution.

Through the co-operation of Dr. Wilson Johnston, the Medical Officer in charge of the Student Health Centre at the Queen's University of Belfast, we have been allowed to extract from his yearly reports the figures of cases examined by him in the 3-year period corresponding to our own series. Of a total of 1609 cases seen in this section of the young adult population of the Province, 503—approximately one-third—showed some skin disease or defect. The diagnosis in any doubtful case was verified by reference to a dermatologist. Table IV shows an analysis of these cases.

Summary.

A series of approximately 30,000 new cases of skin disease seen in Northern Ireland in the years 1954–56 is analysed. Comparison between urban and

rural districts showed a higher incidence of pityriasis rosea and warts in Belfast.

Medical examination of students at the Queen's University of Belfast showed one-third to be suffering from some form of skin disease or defect.

TABLE IV.

	1954.	1955.	1956.	Total.
Infective dermatitis (mainly coccal)	40	34	33	107
Warts	12	22	31	65
Seborrhoeic dermatitis (includes dandruff)	15	23	34	72
Eczema	4	6	10	20
Acne vulgaris	50	56	62	168
Psoriasis	2	2	8	12
Pityriasis rosea	1	2	1	4
Lichen planus	0	1	0	1
Others	17	21	16	54
Totals	141	167	195	503

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LICHEN NITIDUS.

A Case Report.

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Lichen nitidus was first described and named by Pinkus in 1907. It was first observed in men only ; the lesions were typically located on the shaft of the penis and showed characteristic histological features. Identical lesions were later observed also in women, and Kyrle and McDonagh (1909) and Barber (1926) described cases with widespread cutaneous involvement.

Case Report.

A 26-year-old woman was first seen in March 1956 ; she gave no history of previous skin diseases and stated that her first skin lesions had appeared in December 1955 on the flexor surfaces of the arms and on the chest. She consulted a dermatologist, who told us that the disorder resembled at that time an atypical pityriasis rosea ; pink round macules with peripheral desquamation were present and some minute papules were seen in the centre of some of the lesions.

She presented, when first examined by us, a dense eruption of small, hard, skin-coloured and almost transparent conical papules on the chest, the shoulders, the back and the abdomen (Fig. 1). Scattered, very small, discrete papules were noted on the neck, the dorsa of both hands and on the thighs. The flexor surfaces of both arms showed a mild diffuse erythema with some desquamation. The mucous membranes were free, there was no pruritus and no scratch marks were seen. There were no larger papules, no pigmentation and no lesions suggesting lichen planus.

Her medical history revealed thyroidectomy for non-toxic goitre several years ago, and several attacks of sore throats during the last 2 years ; she complained of frequent tension headaches and of " nervousness " and she showed marked anxiety.

The physical examination revealed no abnormality other than the skin lesions and a cyst in the right breast, which was removed surgically and was found to be benign.

Serological tests for syphilis were negative, several liver function tests were normal and a complete haemogram showed as the only abnormality a slightly high sedimentation rate.

Her fasting plasma vitamin A level was abnormally low : 6·43 mcgm. or 27 i.u.%. Her vitamin A absorption curve after ingestion of oleum percomorphi was normal, as was her fasting and post-prandial serum carotene.

Histology.—Two biopsies were done at an interval of three months. The first showed the lesion as a dense cellular mass of ellipsoidal shape in the oedematous upper part of the cutis. The infiltrate was composed of lymphocytes, histiocytes and

some epithelioid cells ; no polymorphonuclear cells were present. The overlying epidermis was flattened to 3 to 4 rows of cells, only one row of the stratum granulosum was present and the stratum corneum was very thin. Some lymphocytes were seen in the epidermis. The rete pegs at both sides of the infiltrate were elongated, forming a lateral wall for the infiltrate.

Fig. 1.

A second smaller lesion was present in the same section, showing a similar cutaneous infiltrate which was separated from the very thin epidermis by a vesicle containing fibrin (Figs. 2 and 3).

Serial sections of the second biopsy revealed again 2 lesions, separated by normal tissue ; the histological features were similar to the first biopsy, but several abortive giant cells were seen in the infiltrate.

The nature of lichen nitidus is obscure. Barber (1926) noted the similarity to lichen planus in some cases ; Ellis and Hill (1938) observed an association of these two disorders in one case and Haynes and Hellier (1937) assumed a close relationship of the two diseases ; Möllers (1955) considered lichen nitidus to be a variant of lichen planus. The histological features of some of our sections correspond fairly closely to the original description, although the tuberculoid structure emphasized by Pinkus in his original paper was not present. It may be mentioned that different sections from the same lesion showed somewhat different features, and sections taken at different times showed also minor variations. Some of the sections resembled bullous lichen planus. The clinical picture, however, did not reflect the histological variations. All

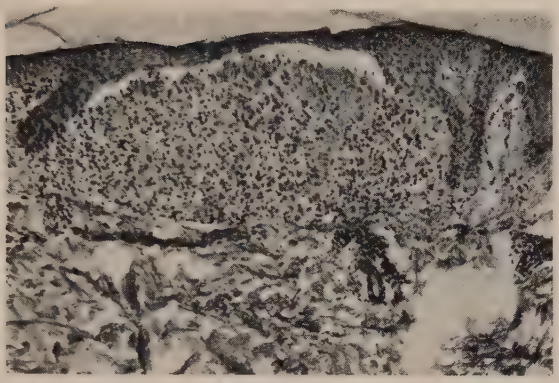

FIG. 2.

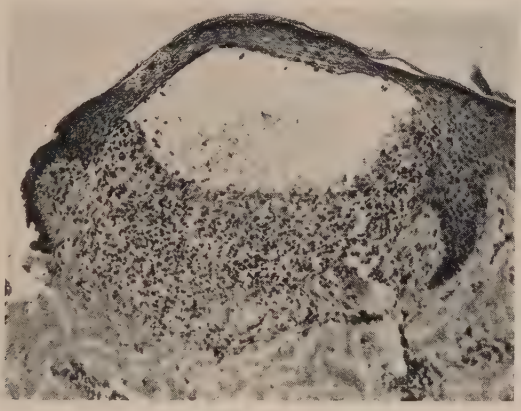

FIG. 3.

lesions were uniform in size, conical in shape, skin coloured and showed no tendency to coalesce. No similarity to lichen planus was seen, neither central healing nor pigmentation nor pruritus occurred. It cannot be stated whether the low vitamin A level was in any way relevant to the disorder.

SUMMARY.

The case of a young woman with a widespread, clinically typical lichen nitidus is described. The histological examination showed the characteristic infiltrate but some lesions showed vesiculation suggestive of a lichen planus pemphigoides.

REFERENCES.

PINKUS, F. (1907) *Arch. Derm. Syph., Wien,* **85**, 11.
KYRLE, J and MCDONAGH, J. E. R. (1909) *Brit. J. Derm.*, **21**, 339.
BARBER, H. W. (1926) *Brit. J. Derm. Syph.*, **38**, 143.
ELLIS, F. A. and HILL, W. F. (1938) *Arch. Derm. Syph., Chicago,* **38**, 569.
HAYNES, H. and HELLIER, F. (1937) *Ann. Derm. Syph., Paris,* 7e, série, **8**, 192.
MÖLLERS, E. M. (1955) *Arch. Derm. Syph., Wien,* **199**, 496.

ROYAL SOCIETY OF MEDICINE.

SECTION OF DERMATOLOGY.

President—Dr. L. Forman.

17 January, 1957.

Lichen Myxoedematosus.—Dr. J. E. M. Wigley, Dr. D. L. Rees, Professor W. St. C. Symmers.

The patient is a married woman, aged 65, who was admitted to hospital complaining of discomfort and tightness of her skin, some irritation, swelling of the small joints of her hands, stiffness of her wrists, general weakness and lethargy.

The skin condition had begun 7–10 years ago with a red area over the right hip which had later become rough and thick feeling and had slowly increased in size. Various other areas have become similarly affected and recently she has noticed that the skin around her mouth has become tight feeling and that she has had difficulty in removing her dentures. For years her fingers have become blue and numb in cold weather. In the last 3 years she has dieted as she was " overweight " and has lost 2 stone.

On examination.—A cheerful, well preserved woman, with a noticeably smooth, pallid face and very restricted smile (Fig. 1*a*, *b*). The chief characteristics of the

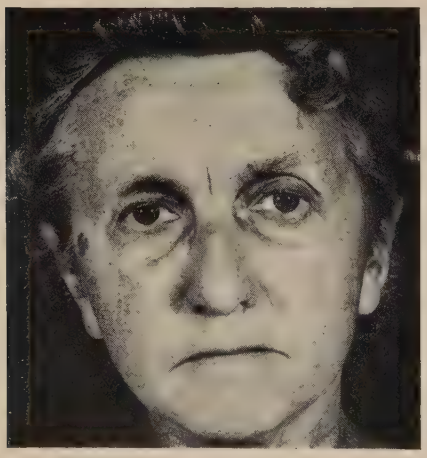

Fig. 1*a*.

Fig. 1*b*.

affected areas of skin are induration without loss of elasticity, and aggregation of papules of varying sizes, many of which have a shiny surface, and a somewhat translucent appearance. The colour varies from flesh colour to a somewhat mauve hue (Fig. 2). The areas affected are the sides of the neck, the V area of the upper chest, the sides of the abdominal wall and the hip and thigh regions.

General medical examination normal.

B.P. 130/75.

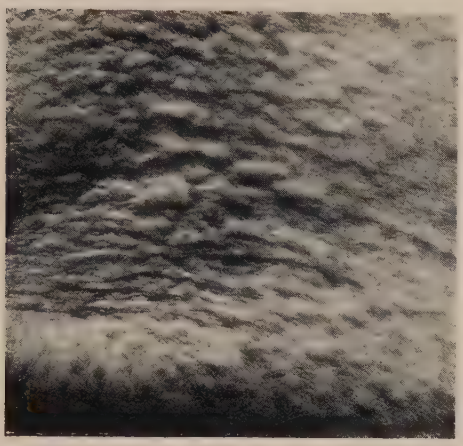

FIG. 2.

Investigation.

Skiagrams.—Chest : Slight increase in transverse diameter of heart. Atheroma of aorta.

Barium meal.—Small sliding hiatus hernia. One or two diverticulae seen in colon. Barium swallow normal.

Blood.—Hb 101%. WBC 7200 (Neutros. 66·5%, eos. 12·5, baso. 1, lymphos. 13·5, monos. 6·5%).

Serum proteins.—Albumin 4·0, globulin 3·1.

Kunkel turbidity = 7 units.

Urinary creatine : 0·03 g./diem.

Urinary creatinin : 3·1 g./diem.

We first made a diagnosis of lichen amyloidosus, not agreeing with an earlier suggestion of sclerodermia. We ordered a biopsy and the result showed we were wrong.

Histology (Professor W. St. C. Symmers).—The specimen included a typical papule of lichen myxoedematosus. The focus of myxoedema-like change in the dermis merged with the surrounding normal dermal connective tissue ; it did not extend to the subcutaneous tissue, being separated from it by a narrow zone of normal dermis. The overlying epidermis showed a little acanthosis and hyperkeratosis, the latter being more evident in the follicular openings than elsewhere ; these changes were not striking. There was some proliferation of fibroblasts, including stellate cells, throughout the myxoedematous area, but this was not marked, and there was no fibrosis ; many of the fibroblasts were stippled with material which gave the periodic-acid Schiff reaction and which was stained metachromatically by toluidine blue.

The myxoedematous material itself was demonstrated by the P.A.S. technique, but not very clearly ; it was intensely metachromatic with toluidine blue and it had a strong affinity for mucicarmine. It did not take up methylene blue at a pH more acid than 5. Metachromatic staining was prevented by exposure to hyaluronidase (" Hyalase ", Benger Laboratories) and was unaffected by diastase (B.D.H.) ; neither enzyme affected the P.A.S. reaction appreciably.

In sum, the histological appearances were those seen in lichen myxoedematosus ; the histochemical studies showed that the mucinous material in the lesion more closely resembled that in the matrix of normal umbilical cord than that in the lesions of true myxoedema.

Course and treatment.—She was treated with thyroid extract and 1, 3, 5, triiodothyronine without effect ; over this period she developed some dysphagia. Later

she was given cortisone 25 mg. *t.d.s.* On this therapy she improved, the skin felt less tight but slight dysphagia persisted. She was discharged home on cortisone 25 mg. *t.d.s.* for 2 weeks and then to reduce the dose to 25 mg. *b.d.*

This case appears almost identical with that shown by Dr. A. Rook in London in February 1956. He then refers to other cases published by Gottron (1954), Montgomery and Underwood (1953) and Donald *et al.* (1953) and gives a good review of the literature.

References.

Rook, A. and Moffatt, J. L. (1956) *Proc. R. Soc. Med.*, **49**, 818.
Gottron, H. A. (1954) *Arch. Derm. Syph., Berl.*, **199**, 71.
Donald, G. F., Hensley, W. J. and McGovern, V. J. (1953) *Aust. J. Derm.*, **2**, 28.
Montgomery, H. and Underwood, L. J. (1953) *J. invest. Derm.*, **20**, 213.

Discussion.

Dr. B. C. Tate : I followed a case like this for about ten years. Apart from the stiffness he remained well generally, his chief complaint being increasing difficulty in removing and inserting his dentures, due to contraction of the mouth. He eventually died of coronary thrombosis. No post-mortem examination was allowed.

Bowen's Disease.—Dr. G. B. Mitchell-Heggs.

A man aged 71.

History.—Nine years' history of an eruption involving the distal two-thirds of the left ring finger. Skiagram of the finger revealed no foreign body or disease of the bone. All fingers were long, thin, tapering, slightly cyanosed and cold. The patient's chief complaint was severe pain. The provisional diagnosis was acrodermatitis continua, with early gangrene. An arteriogram revealed, however, some enlargement of the digital arteries of the affected finger, with numerous dilated abnormal venous channels.

Blood pressure : 160/80 in both arms. General examination—normal.

W.R. normal.

General condition on examination consistent with normal health at his age.

Previous history.—Right lower lobectomy in 1955 for bronchial neoplasm.

The Radiologist, Dr. Sutton, reported that the x-ray appearance was similar to that in an arteriogram of chronic varicose ulcer of the leg. At this time the diagnosis of acrodermatitis continua seemed assured, with this unexpected vascular proliferation.

Postscript.—Since the meeting of 17 January the affected finger was amputated and the histological examination showed typical Bowen's disease. The sections of the bronchi of the lung removed in 1955 were then reviewed and also show similar and typical changes consistent with Bowen's disease.

In retrospect, the patient now states that he thinks he was given arsenic as a tonic for a considerable time thirty years ago following a severe attack of influenza.

Widespread Pigmentation. ? Diagnosis.—Dr. J. D. Everall (for Dr. G. B. Mitchell-Heggs).

History.—A woman aged 50 from Mauritius with a 2 months' history of widespread pigmentation ; she says she had a similar pigmentation 6 years ago which lasted 4 years and then resolved. She has been a widow for 14 years, with no children. Menopause 1945 associated with occasional hot flushes. For the last year or so her general health has been poor.

Previous illnesses.—Suffered from " anaemia " all her life. Twelve months ago she developed oedema of the ankles and feet which lasted 6 months—cause not known.

Family history.—Negative.

On examination.—Plaques of pigmentation about the sides of the neck, axillae, fronts of elbows, inner thighs and groins and beneath the breasts. Abdominal examination normal. Chest examination normal. Enlarged retro-auricular glands.

B.P. 140/80. Urine—normal.

Investigations.—Skiagram of chest normal. Barium meal and follow-through normal.

E.S.R. 35. Hb 14·0 g.%. WBC 10,000 (Polys. 61%, eos. 6, lymphos. 32, monos. 1%).

Some of the lymphocytes are monocytoid in type, have an even cytoplasm and irregular, occasionally pleomorphic nuclei. A few of them have nucleoli. This might indicate a generalized reticulosis. Urine 17-Ketosteroids, 7·7 mg./24 hrs.

Biopsy from lesion on right side of neck : Epidermis of normal thickness. There is a thin layer of keratin over its entire length and this is increased in areas where there are depressions in the epidermis. In the dermis are numerous chronic inflammatory cells with a large amount of melanin, sometimes in macrophages and sometimes lying free, consistent with chronic inflammatory changes.

Comment.—When we first saw her the distribution suggested acanthosis nigricans but clinically and histologically, there is no epidermal change nor has she any underlying organic disease that we can find.

In view of the absence of organic or endocrine disorder to account for this pigmentation, one wonders whether it could be accounted for by some external application, like eau de Cologne (Oil of Bergamot), a perfumed powder or other cosmetic.

Discussion.

Dr. M. L. Gaind : We see this condition quite often in India. It is more common in women, almost always hyperidrotic and overweight ; it is around the eyes, the neck, under the breasts, in the groins and behind the knees, i.e. flexures generally. One patient whom I had in Delhi had pigmentation around the eyes and on the neck for three or four years. She had no treatment, but after she had lived in the hills for three years the pigmentation completely disappeared. These patients almost always report to the doctor at the end of the summer or beginning of winter.

Dr. F. F. Hellier : When you are dealing with people who have coloured skin the slightest thing will upset pigmentation. In U.S.A. they are careful what they do in coloured people because some relatively trivial procedure may produce a very distressing pigmentation. It would be rather risky to treat a coloured person with Grenz rays or any operative procedure which might leave pigmentation of the lesions.

This woman is at the menopause and people do tend to pigment more at that period. There may be some menopausal factor and it might be worth while giving her some oestrogen to help the condition.

The following cases have been published in *Proc. roy. Soc. Med.*, **50**, 391.

Sarcoidosis Simulating Necrobiosis Lipoidica.—Dr. P. F. Borrie.

Impetigo Herpetiformis.—Dr. M. Feiwel and Dr. D. Ferriman.

The following cases also were shown :

Multiple Granulomata [Granuloma Annulare].—Dr. G. B. Mitchell-Heggs.

Acrogeria [Gottron].—Dr. G. B. Dowling (*see Proc. R. Soc. Med.* (1957) **50**, 330).

? Tuberculoid Hansen's Disease.—Dr. J. D. Everall (for Dr. G. B. Mitchell-Heggs).

Calcinosis Circumscripta [Thibierge Weissenbach Syndrome].—Dr. N. A. Thorne.

Chronic Lymphoedema of Eyelids with Plastic Repair.—Mr. C. R. McCash and Dr. M. Feiwel.

Congenital Malformation of Upper Limb—Hæmangiectasia Hypertrophicans, Klippel-Trenaunay-Parkes Weber.—Dr. M. Feiwel.

? Multiple Fibromata; ? Hamartomata of the Fingers.—Dr. Robert Bowers.

Hansen's Disease [Maculo-anæsthetic].—Dr. Louis Forman.

Dr. R. M. B. MacKenna read a short paper entitled **Samuel Plumbe, the Forgotten English Dermatologist.** (*Brit. J. Derm.*, **69**, 215).

BOOK REVIEWS.

Elementary Dermatology.*

This little book, much the same size in length and thickness as the Journal, but three-quarters of an inch wider, is rightly stated by the authors to be very elementary and its forty-three pages can be read in under an hour. It is not intended for qualified physicians or undergraduates ; and it is hardly suitable for nurses, as less than a page is allotted to nursing technique, with no mention of important details such as how to apply tubular bandages or the more complex spread dressings. It would therefore seem to have a limited scope and the reviewer trusts that these authors of undoubted ability will proceed to a wider field. G. A. G. P.

The Medico-chirurgical Encyclopaedia.†

This volume, entirely written by Touraine, is introduced by a discussion on classification ; he divides dermatoses into those with a precise origin and those with a complex origin. One subject from each group is dealt with in major articles. The first considers the reaction of the skin to a wide variety of physical agents, from friction to x-rays, including such things as tattooing, pilonidal sinuses, etc. The other is a masterly dissertation on pruritus and deals with the clinical side, aetiology and pathogenesis, including reference to Shelley's work and a full section on treatment. Subsidiary articles deal with vulvo-vaginitis due to yeasts, the present state of treatment of cutaneous tuberculosis, nodular migratory subacute hypodermites and other subjects recently in the dermatological literature.

F. F. H.

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* *Skin Diseases for Beginners.* R. B. Coles and P. D. C. Kinmont (1957). London : H. K. Lewis & Co. Ltd. Pp. 43. Price 7*d*. 6*d*.

† *Recueil Periodique de l'Encyclopedie Médico-Chirurgicale,* No. 32, 9 (1957). Paris : Editions Techniques.

CURRENT LITERATURE.

A BARBER'S INTERDIGITAL PILONIDAL SINUS. M. C. Oldfield. (1956) *Lancet*, ii, 1244.

A characteristic example of this condition is described. The sinus track was excised. The author mentions the opinion now widely held that all pilonidal sinuses, including the sacrococcygeal ones, are usually acquired, being produced by loose hairs being drawn into small abrasions in the skin. R. H. M.

AN UNUSUAL CASE OF TUBEROSE SCLEROSIS. S. K. Gupta. (1956) *Lancet*, ii, 1289.

The patient with adenoma sebaceum developed epilepsy in the sixth decade. Despite the title, this incomplete form of the disease is the usual one encountered in the dermatological clinic and survival to the age of 51 is not uncommon where gross neurological involvement is not present. R. H. M.

"ESSENTIAL" FATTY ACIDS, DEGREE OF UNSATURATION AND EFFECT OF CORN (MAIZE) OIL ON THE SERUM-CHOLESTEROL LEVEL IN MAN. Ancel Keys, J. J. Anderson and Francisco Grande. (1957) *Lancet*, i, 66.

The serum cholesterol level in man can be lowered by substituting carbohydrate for the common meat and dairy fat in the diet and this does not depend on the intake of cholesterol itself. Different fats vary in their effect and certain vegetable oils may depress the serum cholesterol. Corn (maize) oil has been found particularly effective—and it has been suggested on the one hand that its effect depends on the degree of unsaturation of the constituent fatty acids, and on the other that it depends on the amount of the "essential" fatty acid, linoleic acid. The authors have conducted dietary experiments to compare the relative effects of sunflower seed oil (rich in linoleic acid), fish oil (rich in unsaturated fatty acid) and corn oil.

Serum total and β lipoprotein cholesterol levels were measured in rigidly controlled experiments on 26 men. Corn oil was the most effective in lowering the serum cholesterol level, a finding that does not support the view that the serum cholesterol level is a simple inverse function of the essential fatty acid content, or of the degree of unsaturation of the fatty acids in the diet. The level of cholesterol in the β lipoprotein fraction of the serum was primarily involved in the changes in total serum cholesterol. R. H. M.

LONG-TERM EFFECT OF DRIED THYROID ON SERUM LIPOPROTEINS AND SERUM-CHOLESTEROL LEVELS. B. Strisower, J. W. Gofman, E. E. Gallioni, J. H. Rubinger, J. Pouteau and P. Guzvich. (1957) *Lancet*, i, 120.

THE INFLUENCE OF TRI-IODOTHYROACETIC ACID ON THE CIRCULATING LIPIDS AND LIPOPROTEINS IN EUTHYROID MEN WITH CORONARY DISEASE. M. F. Oliver and G. S. Boyd. (1957) *Lancet*, i, 124.

The first paper (from the Donner Laboratory Group) reports the changes in serum lipoprotein fractions and total serum cholesterol in 39 schizophrenics given dried thyroid, 260 mg. daily and 325 mg. daily. On both doses there was a sustained fall in these levels. The higher the initial level of serum cholesterol the greater was the fall in that level under this treatment.

The second paper records the results of treating 12 euthyroid men suffering from coronary disease with tri-iodothyroacetic acid (Triac). This was given in increasing doses until 4 or 5 mg. daily was reached. The plasma cholesterol, the cholesterol-phospholipid ratio, and the β lipoprotein cholesterol were lowered without increasing the B.M.R. Two patients developed angina of effort with decreased exercise tolerance, even though the B.M.R. was not raised. The fall in plasma cholesterol could not be maintained for long even by increasing the dose of Triac. R. H. M.

ACNE VULGARIS. R. M. B. MacKenna. (1957) *Lancet*, i, 160.

This Watson-Smith Lecture, delivered before the Royal College of Physicians, is a fascinating and comprehensive account of the history, classification and pathology of this common skin-disorder as well as a critical review of suggested aetiological factors and treatment.

It should be read in its entirety. R. H. M.

THE B.C.G. LESION IN SARCOIDOSIS. Paul Forgacs, C. K. McDonald and M. O. Skelton. *Lancet*, i, 188.

Attempts to demonstrate tubercle bacilli in lesions of sarcoidosis have, with a few exceptions, been unsuccessful. It has been suggested that the bacilli are rapidly destroyed by the aggregations of histiocytes that their presence has initiated. The work reported here is an attempt to test this hypothesis by observing whether attenuated T.B. of the strain B.C.G. survive when inoculated into the skin of patients with sarcoidosis. The authors found that they could recover T.B. of this strain six weeks after inoculation and that they were unaffected by passage.

They comment that the rate of development and naked eye and histological appearance of the B.C.G. lesion are not sufficiently distinctive to be relied upon as a diagnostic test of sarcoidosis.

R. H. M.

REAGIN CONTENT OF CHROMATOGRAPHIC FRACTIONS OF HUMAN GAMMA GLOBULIN. J. H. Humphrey and R. R. Porter. (1957) *Lancet*, i, 196.

When human serum is fractionated by chromatography on diethylamidoethyl cellulose, the γ globulin can be resolved into four components. The reagin content of serum from allergic [sic] subjects is almost confined to one of these components which contains about 10% of the total γ globulin.

R. H. M.

RHEUMATOID ARTHRITIS WITH CHRONIC LEG ULCERATION. J. H. Allison and F. Ray Bettley. (1957) *Lancet*, i, 288.

Six patients with crippling rheumatoid arthritis and " rheumatoid " nodules developed ulceration of the leg. Further investigations suggested the diagnosis of systemic lupus erythematosus, the L.E. cell phenomenon being present in four of the patients. The ulcers all looked alike, having a punched out regular edge, surrounding dusky erythema, but no oedema. The commonest site for the ulcers was the lower third of the leg, but they also occurred just below the knee and on the foot. Histologically the ulcer showed areas of collagen necrosis of the dermis and hypoderm surrounded by pallisaded rows of elongated histiocytes. There was no evidence that the ulcers were formed by breakdown of rheumatoid nodules despite the similar histology. The authors suggest that the primary change may be similar to that which originates a rheumatoid nodule in the deeper tissues, but in the dermis it leads to ulceration. They suggest that the patients were suffering from disseminated lupus erythematosus.

R. H. M.

STEVENS-JOHNSON SYNDROME. Ian A. Short. (1957) *Lancet*, i. 290.

Five cases of this syndrome are reported, two being fatal. One showed Wegener's granulomatosis at autopsy ; the other bronchopneumonia. An unsuccessful attempt was made to incriminate thiouracil as the cause of the eruption in one patient by means of P.K. tests and the " distant reversed P.K. reaction ". This means using serum from the patient suspected of being allergic to a drug and injecting it into the skin of subjects taking that drug. The author concludes that drug allergy as a cause of this syndrome is unproven, and he comments on the difficulties of confirming drug allergy by skin testing. He suggests that cortisone and corticotropin are not as effective in controlling the eruption as has previously been reported. The reviewer should point out, however, that the dose of these hormones was not high.

R. H. M.

SYMMETRICAL PERIPHERAL GANGRENE AS A TOXIC REACTION TO SULPHAMEZATHINE AND PENICILLIN. J. M. Barber and Y. A. MacIlwaine. (1957) *Lancet*, i, 510.

A boy aged 12 treated with sulphamezathine for otitis media developed haematuria and albuminuria after 7 days. Penicillin was substituted and 4 days later he developed cold cyanosis of the tips of the fingers, toes and ears, and of the nose. The finger tips became gangrenous but the other affected areas returned to normal. The author suggests that this is an example of arterial damage due to sensitivity to sulphamezathine.

R. H. M.

XANTHOMATOSIS AND ESSENTIAL HYPERCHOLESTEROLAEMIA. J. N. Harris-Jones, E. Grahame Jones and P. G. Wells. (1957) *Lancet*, i, 855.

In the pedigrees of five families with familial xanthomatosis and essential hypercholesterolaemia there is no evidence to suggest that xanthomatosis represents the homozygous form of this metabolic disorder or that hypercholesterolaemia occurring alone represents the heterozygous form. The disorder is transmitted as a dominant trait.

R. H. M.